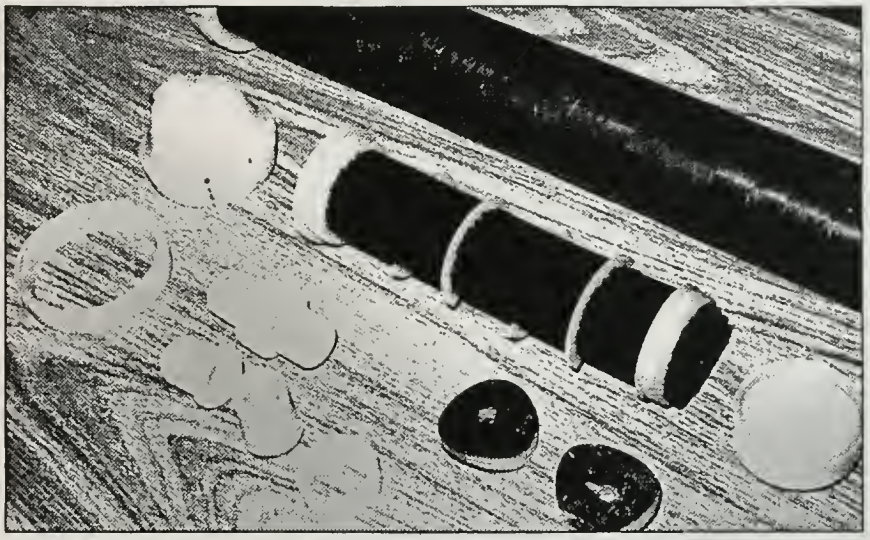
Ontario

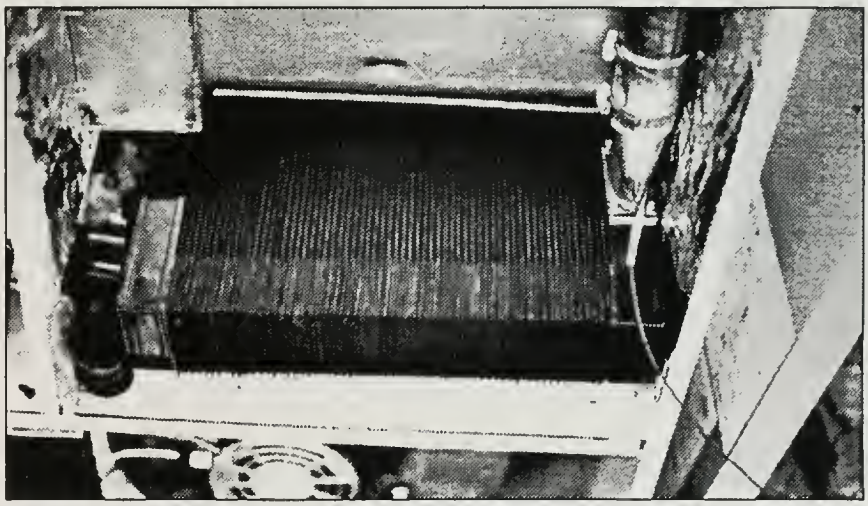
Development of plastic heat exchangers

"Everyone in our organization is responsible for environmental protection. We recognize the contributions of individuals and the support of the Ministry of Environment and Energy."

Finn Hovland
Senior Vice President
Du Pont Canada Inc.
Mississauga, Ontario



Liquid to liquid tube and shell type plastic heat exchanger.



Air to air panel type plastic heat exchanger.

THE COMPANY

Du Pont Canada Inc. is a diversified industrial company which serves customers in domestic and global markets. The company manufactures products in three main categories: fibres and intermediates; specialty chemicals and materials; and specialty plastics and films. Du Pont Canada operates four plants in Ontario for markets which include the automotive, packaging, electrical, food service, dairy and fencing industries.

THE CHALLENGE

Heat exchangers allow heat to be transferred from one stream of liquid or gas to another without the actual mixing of the streams. The exchangers are primarily made from metals such as copper, or alloys such as brass, steel, stainless steel or more unusual materials.

Heat exchangers become less efficient with time because of degradation from corrosion, fouling or leakage. This wastes energy and leads to premature failure.

More durable heat exchangers can be made from plastics. The key is to reduce the thickness of the plastic between the two media to less than 0.010 inches (0.025 cm). Unfortunately, most common plastics cannot be made thin enough to be effective and still withstand typical operating conditions for long periods.

THE SOLUTION

Recent technological advances in plastic polymer technology by Du Pont have led to significant progress in the design and construction of a family of lightweight, corrosion-resistant, high-performance heat exchangers that equal or exceed the performance of conventional heat exchangers.

These engineered polymeric plastic (nylon) heat exchangers have similar heat transfer capabilities and space requirements as conventional metal heat exchangers. They can be used for residential, industrial and commercial applications.

Air-to-air, liquid-to-air and liquid-to-liquid heat exchangers made from nylon have been tested and shown to withstand typical operating conditions including high temperature, pressure, vibration and chemical exposure. They also function well in environments containing glycol, hydrocarbons, sea water, flue gas condensate and other corrosive or degrading compounds.

OPPORTUNITIES

Air-to-air and liquid-to-air heat exchangers have been designed and fabricated for use in residential heating, ventilation and air-conditioning (HVAC) applications. Liquid-to-liquid tube- and shell-type heat exchangers are now available for industrial use. High-performance liquid-to-air heat exchangers to replace metallic radiator cores in automotive applications also have been developed.

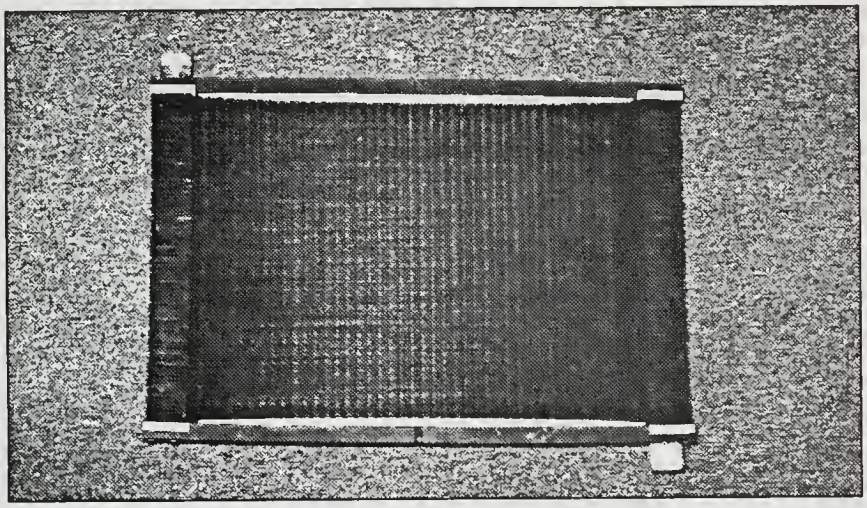
The elimination of heavy metals such as lead, tin and copper, and alloys such as brass, from the manufacture of heat exchangers benefits the environment. Energy is saved in both the manufacture and the operation of the lighter plastic units.

PARTNERSHIP IN POLLUTION PREVENTION AND RESOURCE CONSERVATION

Industrial companies located in Ontario may seek ministry/industry services that will help them to:

* reduce, reuse and recycle solid waste;
* reduce or eliminate liquid effluent and gaseous emissions;
* use energy and water more efficiently.

Equipment and services supply companies can benefit from the information provided on technologies identified for business development.



Liquid to air panel type plastic heat exchanger.

FOR FURTHER INFORMATION, PLEASE CONTACT:

Bruce Babcock
Business Development Manager
Du Pont Canada Inc.
Box 2200
Mississauga, Ontario
L5M 2H3
Tel: (905) 821-5453
Fax: (905) 821-5110

Jack Klieb
Industry Conservation Branch
Ministry of Environment and Energy
2 St. Clair Ave. W., 14th Floor
Toronto, Ontario
M4V 1L5
Tel: (416) 327-1257
Fax: (416) 327-1261
E-Mail: kliebj@gov.on.ca

MINISTRY OF ENVIRONMENT AND ENERGY SERVICES

For information on Ministry of Environment and Energy assistance to industry, please contact the Industry Conservation Branch at (416) 327-1492, Fax (416) 327-1261.

For more project profiles and other publications, visit the ministry's website at http://www.ene.gov.on.ca

This project profile was prepared and published as a public service by the Ontario Ministry of Environment and Energy. Its purpose is to transfer information to Ontario companies about new environmental technologies.

Publication of this project profile does not imply product endorsement. The ministry does not warrant the accuracy of the contents and cannot guarantee or assume any liability for the effectiveness or economic benefits of the recommendations or the technologies described herein or that their use does not infringe privately owned rights.

In addition, the ministry cannot be held liable for any injury or damage to any person or property as a result of the implementation of any part of this profile.

Pour tout renseignement en français au sujet du programme d'écologisation industrielle du Ministère de l'Environnement et de l'Énergie, veuillez composer le 416-327-1253, télécopieur 416-327-1261.

Printed on recycled paper

500 - 07 - 97 PIBS 3354E82